

REMARKS

The claims are 1-24. The specification has been amended to insert the Cross Reference to Related Applications. Reconsideration of the claims is expressly requested.

The Examiner has indicated that claims 3 and 15 contain allowable subject matter; however, claims 1, 2, 4-14 and 16-24 were rejected under 35 U.S.C. §103(a) as being unpatentable over Ahlen U.S. Patent No. 5,767,975 in view of Tsikos et al. U.S. Patent No. 5,013,927. Essentially, the Examiner's position was that Ahlen discloses a device for detecting a marginal edge and markings in the longitudinal direction except for the use of a second diffused light source, which is said to have been taught by Tsikos et al., and that it would have been obvious to modify Ahlen by providing the diffused light source of Tsikos et al. because diffused light evenly illuminates a surface.

This rejection is respectfully traversed.

As set forth in independent claims 1 and 13, Applicants invention provides a device for detecting the marginal edge and a marking substantially extending in a longitudinal direction of a moving material web including at least one optical sensor directed at the material web for scanning the web transversely to

the moving direction, at least one first light source and at least one second light source for emitting diffused light wherein the first light source and the second light source can be alternately (claim 1) or simultaneously (claim 13) employed. The first light source is directed to an area on the material web so that the optical sensor exclusively detects light reflected by the material web in a diffused manner. In this way, the device may be used with material webs having a mirror-like reflection which otherwise would not supply an adequate contrast to the camera and made scanning markings very difficult.

None of the cited references discloses or suggests a device for detecting a marginal edge and markings substantially extending in a longitudinal direction of a moving material web in which the optical sensor exclusively detects light reflected by the material web in a diffused manner.

The primary reference to Ahlen U.S. Patent No. 5,767,975 shows two light sources 43a and 43b that emit light at an angle of about $\pm 60^\circ$ in relation to the plane of the web and perpendicular to the direction 41 in which the web is moving. The light emitted by the light sources 41a, 41b is directed and supplies on the web the narrowly limited illumination zones 44a, 44b. Accordingly, the two light sources 43a, 43b both generate

directed light, whereby the angle of incidence of the light of from $+60^{\circ}$ to -60° can be reversed. The aim is to detect in this manner the three-dimensional structures in the material web 40 caused by different formations of shade.

In contrast to Applicants' device as recited in claims 1 and 13, the arrangement according to FIGS. 8 and 9 of Ahlen shows that in addition to light that is reflected by the web of material in a diffuse manner, the detector also detects light reflected in a mirrored manner. It should be noted that the ray path through the lens 45 according to FIGS. 8 and 10 is shown incorrectly by Ahlen. The ray path shown there does not correspond with a lens as specified by Ahlen at column 7, line 34, but rather with an aperture shutter. The optical component 45 specified by Ahlen would have the ray path specified as shown in Exhibit A attached hereto which corrects the ray path of FIGS. 8 and 10 that would result from the optical component 45 of Ahlen.

As can be seen from the attachment, the correct ray path shows that a divergent bundle of rays originates from each point of the material web 40 within the illuminated surface 44, and is then reproduced by the lens 45 on the detector surface 46. Thus, in addition to light rays that are reflected by the material web

40 in a diffused manner, the detector 46 is impinged upon also by light rays that are reflected in a mirrored manner because of the selected arrangement of the light source. The mirrored light rays are shown in the attached figures by thicker lines. Ahlen consequently fails to disclose or suggest a device for detecting a marginal edge and a marking substantially extending in a longitudinal direction of a moving material web in which **only** diffusely reflected light can be detected by the sensor. Therefore, the Ahlen device cannot be used for metallic material webs because, in that case, the parallel light 43 would lead to a glaring effect in the detector 46.

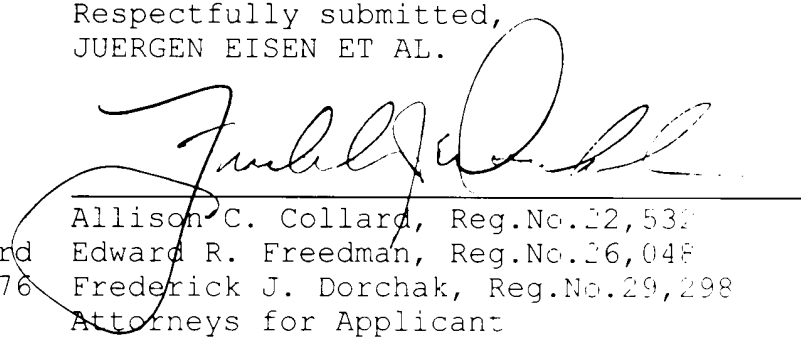
The defects and deficiencies of Ahlen are not remedied by the secondary reference to *Tsikos et al.* U.S. Patent No. 5,013,927. Although *Tsikos et al.* does show a diffuse light source, this light source is not employed for detecting the edge of or a marking on a moving web of material, but rather for measuring the contours of a three-dimensional body. Moreover, even if one were to modify Ahlen with the diffuse light source of *Tsikos et al.* in the manner suggested by the Examiner, one skilled in the art would still not arrive at the feature that a web of material can be illuminated free of glare, on the one hand, and with diffuse light on the other in order to scan the edges or markings of the web. Thus the hypothetical combination

suggested by the Examiner would still not lead one skilled in the art to a device which is able to detect the marginal edge and markings on all sorts of different web materials. Nowhere do the cited references, whether alone or in combination, disclose or suggest that it is even possible to scan a metallically reflecting material, as is possible with device as recited in Applicants' claims 1 and 13.

In summary, the specification has been amended. In view of the foregoing, it is respectfully requested that the claims be allowed and that the application be passed to issue.

Respectfully submitted,
JUERGEN EISEN ET AL.

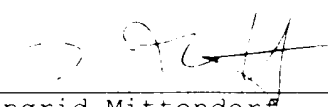
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Enclosure: Exhibit A

I hereby certify that this correspondence is being deposited with the U.S. Postal Service as first class mail in an envelope addressed to: Assistant Commissioner of Patents, Washington, D.C. 20231, on April 21, 2003.


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